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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/862,827	05/22/2001	Jack A. Mandelman	FIS920000224US2(13814A)	9621

7590

07/14/2003

SCULLY, SCOTT, MURPHY & PRESSER
400 Garden City Plaza
Garden City, NY 11530

EXAMINER

LEWIS, MONICA

ART UNIT

PAPER NUMBER

2822

DATE MAILED: 07/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/862,827

Applicant(s)

MANDELMAN ET AL.

Examiner

Monica Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 53-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 53-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

1. This office action is in response to the amendment filed April 29, 2003.

Response to Arguments

2. Applicant's arguments with respect to claims 53-59 have been considered but are moot in view of the new ground(s) of rejection.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 53-56 are rejected under 35 U.S.C. 103(a) as obvious over Schrems et al. (U.S. Patent No. 5,945,704) in view of Gambino (U.S. Patent No. 6,174,756) and Ajit et al. (U.S. Patent No. 5,474,946).

In regards to claim 53, Schrems et al. ("Schrems") discloses the following:

- a) at least one array region (For Example: See Figure 1 and Column 3 Lines 28-33); and
- b) an isolation region (For Example: See Figure 1 and Column 3 Lines 28-33).

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In regards to claim 53, Schrems fails to disclose the following:

a) support region.

However, Gambino et al. ("Gambino") discloses a support region (For Example: See Column 2 Lines 22-38). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Schrems to include a support region as disclosed in Gambino because it aids in providing an efficient formation of an integrated circuit (For Example: See Column 1 Lines 65 and 66 and Column 2 Lines 1-11).

Additionally, since Schrems and Gambino are both from the same field of endeavor, the purpose disclosed by Gambino would have been recognized in the pertinent art of Schrems.

b) at least a gate conductor guard ring formed around said array region on top of said isolation region, wherein said gate conductor guard ring prevents trapping of a stringer of gate conductor polysilicon on said isolation region.

However, Ajit et al. ("Ajit") discloses a guard ring formed around said array region (For Example: See Figure 6). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Schrems to include a guard ring formed around said array region as disclosed in Ajit because it aids in reducing the number of masks and defects (For Example: See Column 1 Lines 10-67 and Column 2 Lines 1-20).

Additionally, since Schrems and Ajit are both from the same field of endeavor, the purpose disclosed by Ajit would have been recognized in the pertinent art of Schrems.

In regards to claim 54, Schrems discloses the following:

a) array region includes a plurality of DRAM cells embedded in a semiconductor substrate (For Example: See Figure 1 and Column 3 Lines 28-30).

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In regards to claim 55, Schrems discloses the following:

a) wordlines (120) overlay each of said DRAM cells and a bitline (185) overlays said wordlines (For Example: See Figure 3).

In regards to claim 56, Schrems discloses the following:

a) each of said DRAM cells are vertical DRAMs (For Example: See Figure 1).

6. Claims 57-59 are rejected under 35 U.S.C. 103(a) as obvious over Schrems et al. (U.S. Patent No. 5,945,704) in view of Gambino (U.S. Patent No. 6,174,756) and Bronner et al. (U.S. Patent No. 5,525,531).

In regards to claim 57, Schrems discloses the following:

a) at least one array region having at least one wordline formed therein (For Example: See Figure 1 and Column 3 Lines 28-33); and

b) an isolation region (For Example: See Figure 1 and Column 3 Lines 28-33).

In regards to claim 57, Schrems fails to disclose the following:

a) one support region having a local interconnect formed therein.

However, Gambino discloses a support region with an interconnect (For Example: See Figure 1A). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Schrems to include a support region with an interconnect as disclosed in Gambino because it aids in providing an efficient formation of an integrated circuit (For Example: See Column 1 Lines 65 and 66 and Column 2 Lines 1-11).

Additionally, since Schrems and Gambino are both from the same field of endeavor, the purpose disclosed by Gambino would have been recognized in the pertinent art of Schrems.

b) at least one wordline and said local interconnect are comprised of identical material.

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However, Bronner et al. ("Bronner") discloses a wordlines and interconnects made of the same material (For Example: See Column 3 Lines 44-67). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the semiconductor device of Schrems to include wordlines and interconnects made of the same material as disclosed in Bronner because it aids in providing low capacitance (For Example: See Column 1 Lines 5-18).

Additionally, since Schrems and Bronner are both from the same field of endeavor, the purpose disclosed by Bronner would have been recognized in the pertinent art of Schrems.

In regards to claim 58, Schrems discloses the following:

a) array region includes a plurality of DRAM cells embedded in a semiconductor substrate (For Example: See Figure 1 and Column 3 Lines 28-30).

In regards to claim 59, Schrems discloses the following:

a) each of said DRAM cells are vertical DRAMs (For Example: See Figure 1).

Conclusion

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica Lewis whose telephone number is 703-305-3743.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on 703-308-4905. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7722 for regular and after final

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communications. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

ML

July 7, 2003



AMIR ZARAJIAN
SUPERVISORY PATENT EXAMINER
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